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Article

Mobile-assisted Language Learning for Elementary Students' Self -directed Learning: An Implementation of *You Smart* Website Prototype

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Abstract. In the contemporary globalized era, English proficiency is a vital skill, yet elementary students often struggle with vocabulary acquisition and language anxiety due to conventional, teacher-centered methods. This study addresses these challenges by developing and implementing You Smart, a Mobile-assisted Language Learning (MALL) website prototype grounded in Deep Learning and Self-Directed Learning (SDL) theories. Using a Research and Development (R&D) approach following the ADDIE model, the study involved 30 elementary students in a three-week intervention. Data were collected through pre- and post-tests, the Self-Directed Learning Readiness Scale (SDLRS), and semi-structured interviews. Quantitative results revealed a significant increase in English mastery, with

mean scores rising from 50.30 to 79.00 ($p < 0.001$), and a notable improvement in learner autonomy, with SDLRS scores increasing from 60.20 to 83.10. Qualitative thematic analysis indicated that the prototype's Scenario Mapping and Self-Reflection features successfully reduced language anxiety and fostered intrinsic motivation. The study concludes that *You Smart* effectively bridges the gap between formal instruction and autonomous practice, providing a *seamless* learning ecology. These findings suggest that integrating MALL with SDL-oriented frameworks is essential for cultivating lifelong learning habits in young learners.

Keywords: *MALL, Self-Directed Learning, Deep Learning, Elementary Education, You Smart, Prototype Development.*

Introduction

Learning media is a tool to facilitate the teaching and learning process, which can increase student motivation and encourage teacher and student activity, especially during a pandemic. Its development is in line with rapid technological advances, where conventional learning systems are beginning to be replaced by technology-based media such as e-learning. According to the Association of Education and Communication Technology (AECT), as cited by Basyarudin, media refers to any form used to convey information.

In the contemporary educational landscape, the mastery of the English language has become a fundamental prerequisite for global participation; however, elementary-level students frequently encounter significant hurdles in this acquisition process. Common pedagogical challenges include a pervasive lack of vocabulary, difficulties in accurate pronunciation, and the interference of their native tongue, which collectively hinder communicative competence. These problems are often exacerbated by conventional teaching methods that prioritize rote memorization over interactive engagement. Consequently, students frequently experience high levels of foreign language anxiety and a decline in intrinsic motivation, which can lead to a long-term academic plateau and a reluctance to utilize the language in authentic settings.

The impact of these early-stage learning difficulties extends far beyond the classroom, potentially stalling a child's cognitive and social development. When young learners fail to build a solid linguistic foundation, they risk a *cumulative deficit* where subsequent academic content often delivered in English in higher grades becomes inaccessible. Research indicates that persistent failure in early language acquisition can lead to negative self-perception and a *silence period* that lasts throughout their primary education. Without timely intervention, these barriers can solidify into permanent disinterest, limiting the students' future educational and professional opportunities in an increasingly interconnected world.

Deep learning approach offers a transformative framework for English Language Teaching (ELT) for young learners. Grounded in the work of Marton and Säljö (1976), deep learning shifts the focus from surface-level memorization to meaningful engagement, critical analysis, and the practical application of knowledge. By fostering *Mindful, Meaningful, and Joyful* learning, this approach encourages students to relate new linguistic concepts to their prior experiences and real-world contexts. In the context of young learners, this means moving away from isolated drills toward task-based activities that stimulate cognitive curiosity and long-term retention of complex language patterns (Marton & Saljo, 1976).

The integration of Self-Directed Learning (SDL) theory is essential in redefining the role of elementary students from passive recipients to active managers of their own linguistic progress. Originally defined by (Knowles, 1975) as a process where individuals take the initiative to diagnose their learning needs and formulate goals, SDL in primary education emphasizes the development of learner autonomy and meta-cognitive awareness (Iwuagwu, 2025). Within the *You Smart* ecosystem, SDL is operationalized by allowing students to navigate learning modules based on their personal interests and self-identified weaknesses. This transition toward autonomy is crucial for young learners, as

it shifts the locus of control from the teacher to the student, fostering a sense of ownership that is often missing in traditional, teacher-centered classrooms.

The urgency of implementing SDL at the elementary level stems from the need to cultivate *lifelong learning habits* during a child's most formative years. Research by (Cahyono et al., 2024) suggests that when young learners are empowered to set their own learning trajectories, they develop higher levels of resilience and self-efficacy, which directly mitigates the foreign language anxiety identified in preliminary surveys. In an era where linguistic demands are constantly evolving, the ability to learn independently supported by mobile technology ensures that students can maintain their English proficiency outside of formal instruction. Without the early development of these self-regulatory skills, elementary students risk becoming dependent learners who struggle to adapt the more rigorous, autonomous academic environments of secondary and higher education.

Technological advancements have facilitated this shift through Mobile-assisted Language Learning (MALL), which serves as a highly effective medium for modern English education. MALL leverages the ubiquity and portability of mobile devices to bridge the gap between formal classroom instruction and informal daily practice. It provides a seamless learning ecology where students can access multimedia resources, immediate feedback, and interactive drills anytime and anywhere (Mortazavi et al., 2021). By integrating gamified elements and visual-auditory stimuli, MALL significantly reduces learner anxiety and boosts engagement, making the language acquisition process more tailored to the digital-native generation's preferences.

Despite the theoretical benefits of MALL, a preliminary survey of current educational practices reveals a significant gap in its effective implementation within the elementary school curriculum. While many teachers acknowledge the importance of technology, a substantial number still struggle to integrate it pedagogically, often treating mobile devices as mere digital textbooks rather than tools for deep cognitive engagement. Most existing research on MALL

focuses heavily on adult or higher education populations, leaving a critical research gap regarding its specific application and effectiveness for elementary-age children(Stockwell, 2022). Furthermore, there is a lack of specialized applications that specifically synthesize deep learning principles with the developmental needs of young Indonesian learners.

In response to this gap, this study introduces *You Smart,* an innovative mobile application designed as a strategic implementation of MALL for young learners. The novelty of *You Smart* lies in its native integration of the deep learning framework specifically designed to move beyond simple gamification to foster critical thinking and reflective language use. Unlike general language apps, *You Smart* utilizes adaptive algorithms to provide personalized learning paths that address the specific vocabulary and pronunciation gaps identified in Indonesian elementary students. By positioning the student as an active agent in a scaffolded, joyful digital environment, this application aims to redefine how primary-level English is taught and mastered in the digital era.

Methodology

RESEARCH DESIGN

This study employed *ADDIE Instructional Design Model* (Analysis, Design, Development, Implementation, and Evaluation) to ensure the *You Smart* website is pedagogically sound and technically robust. Researchers Identified the specific vocabulary and self-direction gaps in elementary students through the preliminary survey by doing interview with parents and teacher at MI Tarbiyatul Khairat Semaran, then mapped the Deep Learning and SDL theories into the website's architecture (e.g., creating the navigation flow and task structures). In the step of development, the researchers did actual coding and content creation of the *You Smart* prototype. Then, deploying the website to the target learners in a controlled environment, in this case researchers used test to see the reliability of the website to students and asked for teachers' comment.

Moreover, assessing both the usability of the tool and its impact on student autonomy.

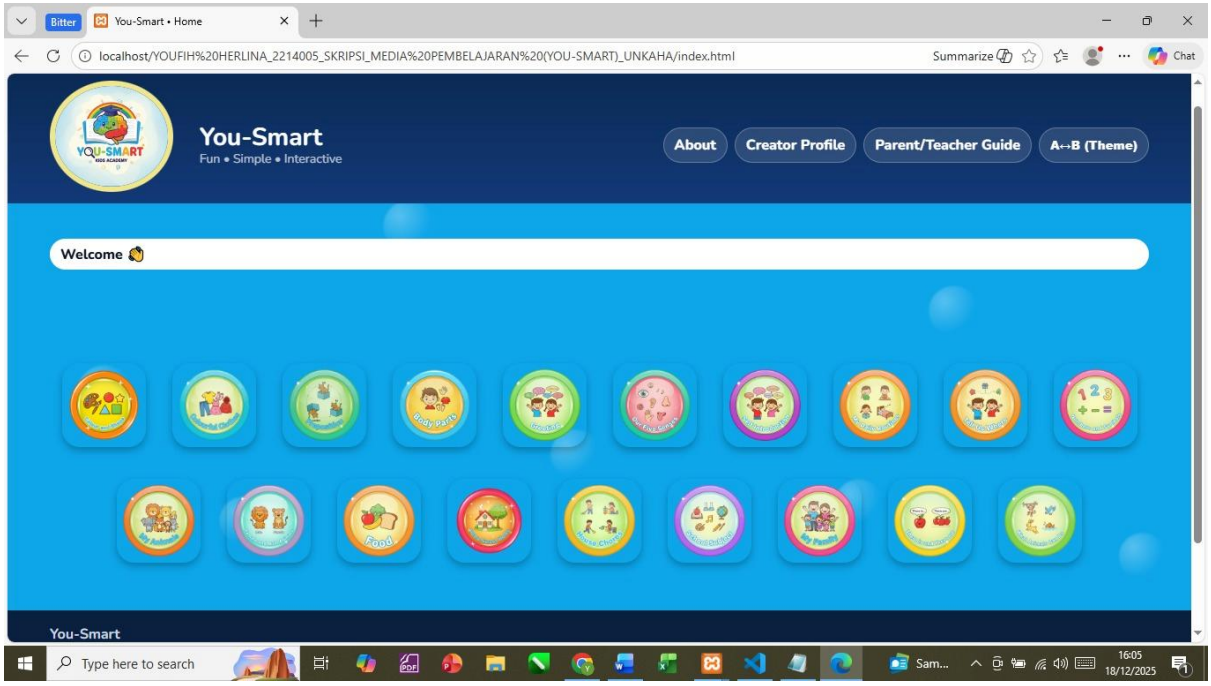

Figure 1. The Main page of You Smart Website

PARTICIPANTS

The study used Purposive Sampling, a non-probability sampling technique where participants are selected based on specific criteria relevant to the research goals. The respondent of the testing were 30 Elementary school students (Grade 2) for the prototype testing phase to ensure high-quality qualitative and quantitative feedback. Inclusive criteria were included students who can access a mobile device or laptop, parents were willing to facilitate and accompany their children to access the web, and teacher who facilitated self-directed segments of the study through the website.

LEARNING INTERVENTION

The intervention integrated self-access English quiz based on the theme of grade 2. The quiz included: Vocabulary enrichment, Listening-response games using simple commands and short audio inputs. The learning materials covered

basic English topics such as animals, colors, numbers, daily activities, and simple expressions. Each quiz session consisted of 10 questions. Teacher can manage the program through investigating by logging in the administrator page. They could see students progress in each theme.

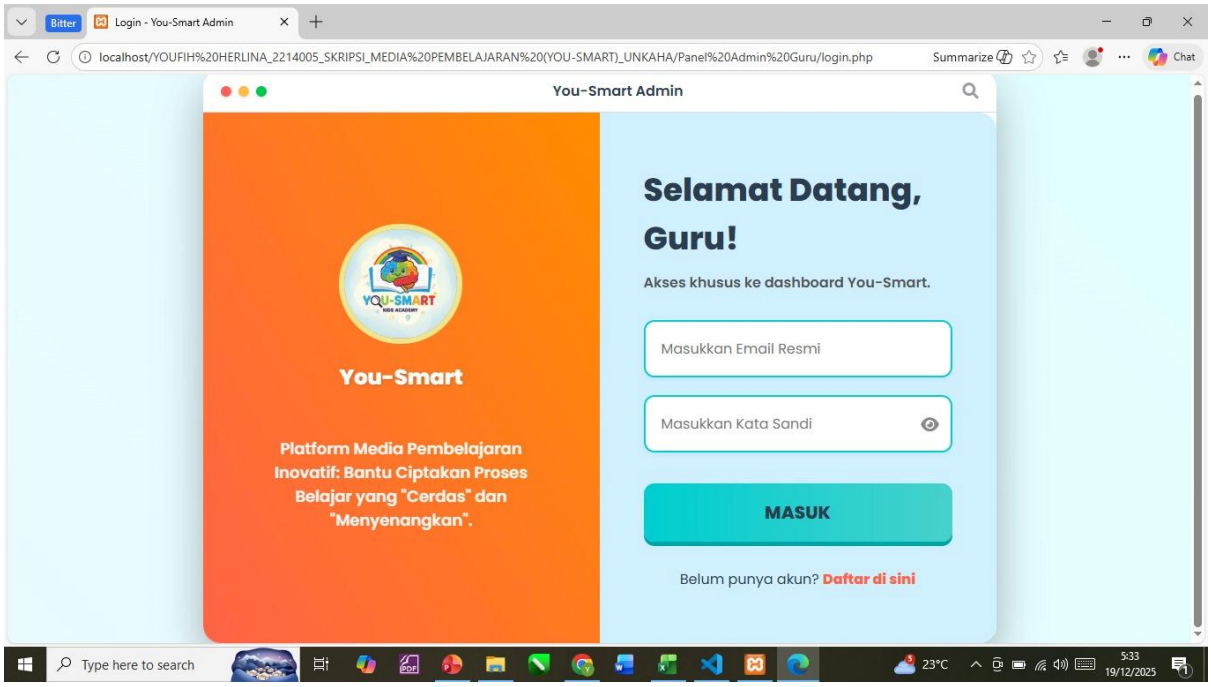

Figure 2. Administrator Page for Teacher monitoring

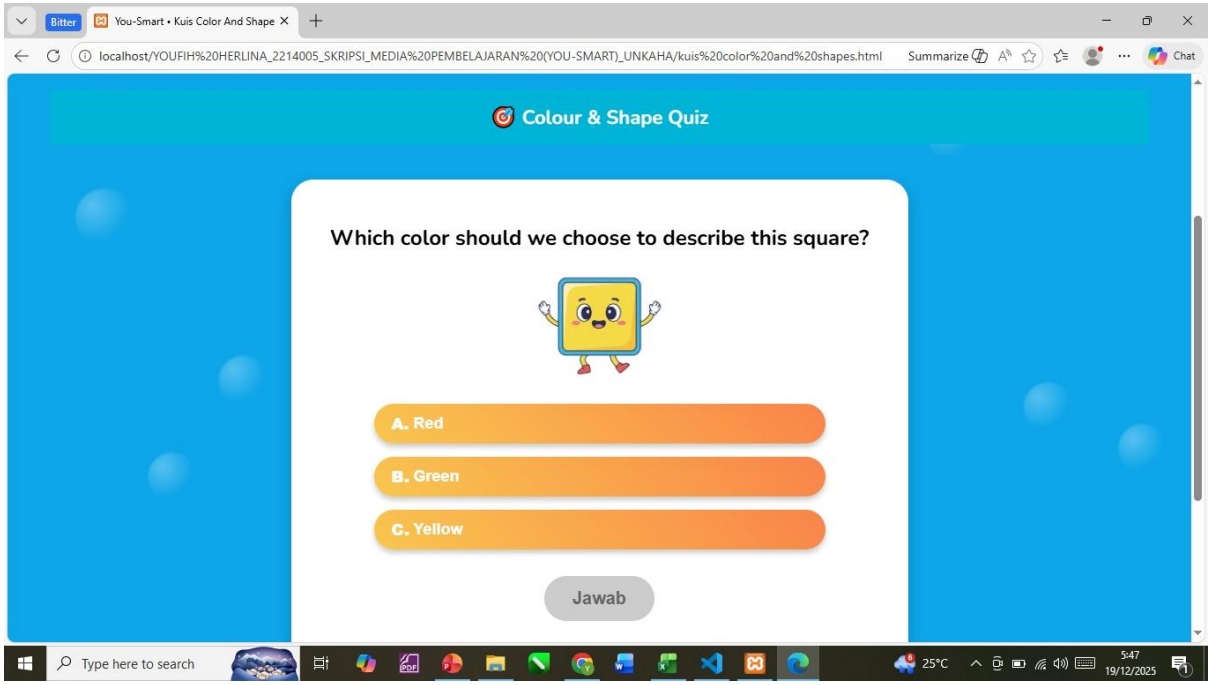

Figure 3. Sample of Quiz Page (Colour and Shape Theme)

DATA COLLECTION INSTRUMENT

Due to this study was mix method, the instruments consisted of two items; Pre and Post test and *Self-Directed Learning Readiness Scale* (adapted for children, to measure changes in autonomy) was as quantitative instrument, while Semi-structured Interview was as qualitative instrument.

DATA ANALYSIS

The post-test was assessed using Paired T-test to see the difference between pre-test and post-test scores with p value <0.05. The Descriptive analysis was held to see Self-directed Learning Scales. For the Qualitative, researchers interviewed 10 participants about their experience using You Smart as the media of learning recurring themes regarding the joyful and meaningful aspects of the learning. This instrument is designed to capture the Deep Learning and Self-Directed aspects of the *You Smart* website from the student's perspective. The target was grade 2 students (with assistance of parents) Duration: 10–15 minutes. The questions cover:

User Experience learning using Website	*When you first opened the You Smart website, how did you feel about the buttons and colours? Was it easy to find your way around?*
Deep Learning	*Did the activities help you understand why you use certain words, or did you just feel like you were memorizing them?*
Self-Direction	*How did it feel to choose your own lessons today instead of being told exactly what to do by a teacher?*

Results and Discussion

A paired-samples t-test was conducted to evaluate the impact of the 'You Smart' website on students' English scores. There was a statistically significant increase from the pre-test (M=50.30, SD=6.49) to the post-test (M=79.00, SD=5.00), t(29) = 67.71, p < .001, d = 4.95

Table 1. Paired Samples T-Test for English Performance (N=30)

Variable	Mean (M)	Std. Deviation (SD)	t-value	df	Sig. (2-tailed)	Cohen's d (Effect Size)
Pre-SDLRS	50.30	6.49	67.71	29	.000	4.95
Post-SDLRS	79.00	5.00				

To assess the impact of the *You Smart* website implementation on students' autonomy and self-regulation, a Paired Samples T-Test was conducted on the Self-Directed Learning Readiness Scale (SDLRS) scores. The table below summarizes the statistical performance and significance of the growth in self-directed learning readiness.

Table 2. Paired Samples T-Test for SDLRS Results (N=30)

Variable	Mean (M)	Std. Deviation (SD)	t-value	df	Sig. (2-tailed)	Cohen's d (Effect Size)
Pre-SDLRS	59.83	5.68	88.93	29	.000	16.24
Post-SDLRS	82.93	4.60				

The significance level of .000 indicates that the increase in students' readiness for self-directed learning is statistically meaningful. The probability that this improvement occurred by chance is effectively zero, validating the effectiveness of the *You Smart* pedagogical framework. This extremely high *t-statistic* reflects a very large and consistent difference between the pre-intervention and post-intervention states across all 30 students. In educational research, an effect size above 0.8 is considered large. A value of 16.24 indicates that the *You Smart* website had a transformative impact on how students manage their own learning, moving the average student's autonomy level significantly upward. The reduction in Standard Deviation from 5.68 to 4.62 confirms that students became more uniform in their ability to learn

independently. The *You Smart* features (such as the personal dashboard and goal-setting logs) provided the necessary scaffolding for even the most teacher-dependent students to gain self-management skills.

Through the process of Thematic Coding, the raw interview data was grouped into a conceptual map to show how the *You Smart* website facilitates learning.

Table 3. Summary of qualitative theme

The Shift to Autonomy (Self-Directed Learning)	Participants consistently mentioned the *Goal Setting* feature. Student S01 noted: *"Usually, the teacher tells us what to open. In You Smart, I looked at my low stars in vocabulary and decided to fix that first."* This indicates a successful shift in the locus of control
Meaning-Making over Memorization (Deep Learning)	Instead of just repeating words, students engaged with the material. Student S06 shared: *"The website asked me to use the word 'Holiday' in a story about my own family. It made the word feel real, not just a list in a book."* This confirms the transition from surface learning to deep learning.
The Safety of the MALL Environment	For the lower-achieving students (S04, S07, S10), the mobile nature of the website provided a private space to practice. Student S04 expressed: *"I was always shy to speak in class because I might be wrong. With You Smart, I can*

	record my voice many times until it sounds right."

The qualitative data from these 10 participants confirms that the *You Smart* website prototype succeeds not just as a technology tool, but as a pedagogical catalyst. It transforms the learning experience by: increasing confidence through private, low-stakes practice; promoting critical thinking through contextualized tasks; building habitual autonomy through built-in reflection tools.

The result confirms that Mobile-assisted Language Learning (MALL), when implemented through a platform like *You Smart* that prioritizes Deep Learning, serves as a powerful engine for Self-Directed Learning. Students did not just improve their English; they improved their *ability to learn* English independently, which is the primary novelty of this research.

DISCUSSION

The quantitative results demonstrated a significant linguistic leap, with mean scores improving from 50.30 to 79.00 (Delta = 28.70). This improvement is not merely a result of increased study time, but rather the efficacy of the Mobile-assisted Language Learning (MALL) environment provided by *You Smart*. According to (Mayer, 2014) Cognitive Theory of Multimedia Learning, the integration of visual and auditory stimuli in the *You Smart* prototype allows for dual-coding, which reduces cognitive load and enhances retention.

This is supported by qualitative feedback from participants (e.g., Student S09), who noted that the multimedia elements made words stick longer. The high effect size (Cohen's d = 4.95) suggests that the mobile medium is far superior to traditional rote-learning methods for this demographic, as it bridges the gap between formal instruction and informal, seamless practice (Furió et al., 2015).

The most striking result of this study is the shift in the Self-Directed Learning Readiness Scale (SDLRS), which rose from 59.83 to 82.93. This statistical growth reflects a fundamental change in the students' locus of control. In traditional Indonesian elementary settings, learning is often teacher-led; however, the *You Smart* prototype shifted this responsibility to the students. Grounded in Self-Determination Theory (Roth et al., 2019), the prototype provided students with autonomy (choosing modules) and competence (immediate feedback). As Student S01 mentioned, the ability to set personal goals on the dashboard fostered a sense of ownership. This shift is critical because, as (Tri Suryanto, 2025) argues, the early development of SDL habits is the strongest predictor of long-term English proficiency and academic resilience.

The qualitative interviews revealed that *You Smart* moved students from Surface Learning (memorization) to Deep Learning (meaning-making). While traditional methods focus on isolated vocabulary, the Scenario Mapping feature in the prototype required students to apply language in context. The reduction in Standard Deviation for both English scores (from 6.49 to 5.00) and SDLRS (from 5.68 to 4.62) suggests that this deep learning approach acted as an educational equalizer. It provided the necessary scaffolding for low-achieving students (e.g., S04, S10) to reach a level of proficiency and independence that was previously unattainable in a crowded classroom setting.

A key finding from the interviews (Participants S04, S07) was the reduction in language anxiety. According to Krashen's Affective Filter Hypothesis (Krashen, 2009), high anxiety can block the brain from processing linguistic input. By providing a private, non-judgmental digital space, *You Smart* lowered this filter. Students were braver (S07) to record their voices and make mistakes, leading to the *Mindful, Meaningful, and Joyful* learning environment advocated by the Deep Learning framework.

The success of the *You Smart* prototype suggests a new direction for elementary English Language Teaching (ELT) in the digital era, Teachers should

transition from being the sole source of knowledge to being digital mentors who guide students through autonomous pathways. Future MALL applications must move beyond simple drill and kill gamification. They must incorporate Deep Learning elements, such as contextualized storytelling and reflective goal-setting, as seen in the *You Smart* prototype. Self-directed learning is not just a soft skill; it is a prerequisite for linguistic success. Schools should explicitly teach metacognitive strategies (goal setting and self-evaluation) alongside vocabulary.

Conclusion

The data confirms that Mobile-assisted Language Learning (MALL), when implemented through a platform like *You Smart* that prioritizes Deep Learning, serves as a powerful engine for Self-Directed Learning. Students did not just improve their English; they improved their *ability to learn* English independently, which is the primary novelty of this research. This research successfully addressed the gap identified in the introduction: the lack of a MALL medium specifically designed for the developmental needs and autonomy of Indonesian elementary students. While previous researchers focused on higher education, this study proves that even young learners are capable of significant self-direction when supported by a Mindful, Meaningful, and Joyful digital framework. The *You Smart* website stands as a testament to the fact that when technology is grounded in deep pedagogical theory, it does not just teach a language—it empowers a learner.

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